Specification Amendments

Page 3, last paragraph (lines 26-30):

The section preferably isolates the cavity from external forces outside and adjacent the cavity. The section preferably includes a transmitting and emitting screen. The screen can be of an annular shape, or of a circular shape, or of a ~~rhombohedrion~~ rhombohedron shape.

Page 11, lines 4-8:

The section 20 preferably isolates the cavity 12 from external forces outside and adjacent the cavity 12. The section 20 preferably includes a transmitting and emitting screen 24. The screen 24 can be of an annular shape, or of a circular shape, or of a ~~rhombohedrion~~ rhombohedron shape.

Page 28, lines 13-26:

The numerical calculations were done with the FMT-developed special secondary emission code FMTSEC, where FMTSEC is defined as a particle-in-cell computer

simulation code capable of handling secondary emission. It is a completely self-consistent two-dimensional relativistic particle-in-cell code which treats cartesian (x-y), cylindrical (r-z), and polar (r-θ) geometries. The field solving algorithm leapfrogs the electromagnetic fields on a staggered mesh and solves Gauss' law by diffusing away numerical errors arising from the particle-to-grid apportionment (i.e., Marder's algorithm [B. Marder, Journal of Computational Physics, 68, **48** (1987)]). The particle pusher is a Runge-Kutta second-order accurate algorithm. The charge accumulation scheme is area weighting. Graphics are done by post-processing, and dump files corresponding to values of the electric field and current density at specific points within the gun are generated.

Page 45, lines 1-12:

In this section the growth rate of the diocotron instability (an important criterion for studying the stability of hollow beam equilibrium) for the hollow beam we are considering for a microwave generator application is evaluated. The e-folding time is given by

$$\tau_e = (4/\sqrt{4c-b^2})\ (\Omega_c/\omega_p^2)$$

where $\Omega_c = eB/m$ and the geometric factors c and b are expressed in the following form

$$b = l\ [(1-(r_1/r_2)^2] + \left|(r_2/r_c)^{2l} - (r_1/r_2)^{2l}\right|$$

$$-(r_1/r_c)^2][1-(r_1/r_c)^{2l}] - [(1-(r_1/r_2)^{2l}][(1-(r_2 \tag{40}$$

and have defined r_1, r_2, r_c to be the inner and outer beam radii and outer conductor radius respectively and l is the azimuthal mode number. The worst case to consider is for the $l=2$ mode. For the example parameters: $n=6.25 \times 10^{11}\text{cm}^{-3}$ (100 nC/cm^3), $B=4.5$ kG, $r_1=2.68\,cm,\ r_2=3.04\,cm$ and $r_c=3.09\,cm$, the e-folding time is about 2 nsec. This e-folding time allows a transport length of meters. This length is suitable for microwave generation.